

reduction of water infiltration into the landfill is expected to be 99% . This cap option provides an adequate protective soil layer depth for the GCL component of the cap against the effects of freeze-thaw cycles, thus maintaining cap integrity. However, there would be technical difficulties in constructing this cap due to landfill boundaries and physical barriers. The cost is estimated to be more expensive than Alternative 4A.

Compliance with Applicable or Relevant and Appropriate Requirements

Section 121(d) of CERCLA and NCP Section 300.430(f)(1)(ii)(B) require that remedial actions at CERCLA sites at least attain legally applicable or relevant and appropriate Federal and State requirements, standards, criteria, and limitations which are collectively referred to as "ARARs," unless such ARARs are waived under CERCLA section 121(d)(4).

ARARs can be chemical-specific, action-specific and location-specific. In addition to the chemical-specific ARARs for soil/sediment, groundwater and surface water, the action-specific ARAR for landfill closure requirements have a significant role for this Site. This is especially due to the history of the Site. The interim cap did not meet 35 IAC, Part 807 for the landfill side slopes, nor did it meet any of the requirements for 35 IAC, Part 811/814.

Illinois' 35 IAC Part 807 requirements were effectively replaced by more stringent landfill requirements under 35 IAC Parts 810-815, effective on September 18, 1990. The new Illinois landfill regulations were passed, in large part, to address landfill cap failures under the old Part 807 standards. In general, the new Illinois regulations were more extensive and more stringent than the federal RCRA Subtitle D landfill standards (which were effective October 9, 1991). The Illinois regulations were revised to incorporate the aspects of RCRA Subtitle D that were not already covered by Illinois law, and allowed Illinois to implement Subtitle D.

The new Illinois standards had certain grandfather provisions. In particular, Part 814, Subpart E of the 1990 regulations allowed existing facilities to close under the old regulations (35 IAC 807) if closure was initiated by September 18, 1992.

Although the operators of the MIG/DeWane landfill did not initiate closure prior to the landfill being abandoned in 1988, the landfill did stop receiving wastes prior to 1992. Originally, the landfill may have been entitled under state law to close under the old 807 closure standards. However, federal law provides that when hazardous wastes will be left at a site, state and federal requirements that may not be directly applicable, may still be relevant and appropriate to the circumstances of the release. Apparently the landfill, although permitted to do so at the time, received wastes containing hazardous constituents. This same situation occurred at many Municipal landfills prior to the enactment of the RCRA regulations of 1980.

If a standard, or a portion of a standard, is relevant and appropriate, then that standard (or portion thereof) must be attained by the remedy just as if the standard were directly applicable. The Ill. EPA and the U.S. EPA determined that the landfill cap and other provisions of Part 35 IAC 811/814 are relevant and appropriate due to the circumstances of the release of chemical

contaminants.

Due to the dates during which waste was disposed of within the landfill, 35 IAC 807 may be considered the only directly applicable regulations. However, it is entirely appropriate to follow the detailed requirements specified in the 35 IAC 811/814 regulations in order to comply with the general requirements of the older 807 regulations that lack details. For example, the old regulations only have general provisions prohibiting threats of air pollution (807.312) and water pollution (807.313 & 870.315). Specific requirements describing details for gas collection, leachate collection and monitoring of air and groundwater are lacking. Yet, those systems may be necessary to comply with the old general provisions. It is both relevant and appropriate to follow the more detailed standards found in 34 IAC 811/814 to provide for a more environmentally sound landfill system.

The Illinois EPA and the U.S. EPA believe that 35 IAC 807 is applicable and that 35 IAC 811/814 are relevant and appropriate. The Site was abandoned and presented a sufficient hazard to human health and the environment to be placed on Superfund's list of national priorities. At the time of its listing on the NPL the site did not have a landfill bottom liner, adequate landfill gas controls, any significant long-term maintenance, nor capping materials impermeable enough to protect groundwater, or protection of the cap from freeze-thaw or wet-dry cycle (which would ultimately impact cap integrity). Groundwater at the Site became contaminated at levels exceeding federal and state action limits. Although interim measures were initiated in 1991 to stabilize the site and reduce infiltration of water, only a partial cap was placed on the landfill and it did not fully meet the 807 requirements for the landfill side slopes, but only for the landfill crest or about 1/3 of the landfill area. The existing partial cover, or interim cap has been subjected to repeated freeze-thaw and wet-dry cycles and needs to be repaired and reconstructed to meet the 811 standards.

Alternative 1: Alternative 1 does not comply with the 35 IAC 807 requirements nor with the 35 IAC 811 ARARs for landfills. Even after the interim cap work of 1992/3, the landfill does not comply with Section 807.305 (Cover), Section 807.312 (Air Pollution), Section 807.313 (Water Pollution), and Section 807.315 (Protection of Waters of the State). Until contaminant concentrations are reduced to acceptable levels through gas removal, leachate removal, landfill capping, waste containment, and the natural attenuation mechanisms for groundwater, the requirements of 35 IAC Parts 811/814, as well as various other regulations would not be met. This alternative also would not meet the 35 IAC 620 groundwater regulation ARARs.

Alternatives 2A and 2B: Alternative 2A does not comply with ARARs for remediating the landfill until contaminant concentrations are reduced to acceptable levels. The proposed cap does not meet the requirements of 35 IAC Parts 811/814. Alternative 2B may meet the 620 ARARs for the upper range for infiltration rate reduction, but the low range of the infiltration rate reduction estimated would not meet the MCLs for vinyl chloride, thus it would not comply with the 620 ARAR. The cap would not be adequate to effectively reduce the generation of leachate, and thus groundwater contamination. Alternative 2B would not comply with the requirements of

35 IAC Parts 811/814.

Alternatives 3A and 3B: Alternatives 3A do not comply with 35 IAC Parts 811/814. Alternative 3A does not provide adequate protection from the affects of freeze and thaw, thus the cap integrity would not meet the regulations required by 811. The range estimated for the infiltration rate is too low and that low end of the range to effectively remediate vinyl chloride and meet the groundwater regulations, 35 IAC 620. Alternative 3B meets the 811 requirements, put would not meet the 620 ARARs.

Alternative 4: Alternative 4 does not comply with 35 IAC Parts 811/814, in that the depth of the protective soil layer cover over the GCL would be inadequate, and may result in the failure to eventually comply with 620 ARARs.

Alternative 4A: Alternative 4A does more fully comply with 35 IAC Parts 811/814, in that the depth of protective soil layer cover in combination with the GCL would be adequate to meet the 620 ARARs.

Alternative 5: Alternative 5 does comply with 35 IAC Parts 811/814 and would be expected to meet the 620 ARAR.

Long-Term Effectiveness and Permanence

Long-term effectiveness and permanence refers to expected residual risk and the ability of a remedy to maintain reliable protection of human health and the environment over time, once clean-up levels have been met. This criterion includes the consideration of residual risk that will remain onsite following remediation and the adequacy and reliability of controls.

Alternatives 1, 2A and 3A: Alternative 1 would not provide the required long-term effectiveness and permanence due to inadequate depth of soil cover, inadequate protection from freeze-thaw cycles, etc.,(see details above in the Overall Protection of Human Health and the Environment section). For 2A and 3A, the long-term integrity of the cap design is also doubtful. The lack of adequate cap integrity would result in continued exposure of refuse, excessive leachate generation, and the continuing contamination of groundwater above the MCLs.

Alternatives 2B and 3B: These two alternative would provide better containment of the contaminants, then alternatives 1, 2A and 3A, and reduce the generation of leachate. However, the long-term effectiveness and permanence may not be adequate since they do not meet the recommended minimum cap design requirements to adequately reduce groundwater infiltration to allow for a reduction in leachate generation levels. Without an adequate reduction in leachate generation, natural attenuation would not be able to reduce all groundwater contaminants to eventually meet the MCLs.

Alternative 4: This alternative may not provide for adequate long-term protection of the critical component of its cap design, the GCL; therefore it would not appear to meet this criterion. The

inadequate depth of protective soil cover may result in damage to the GCL layer, resulting in the excessive infiltration of precipitation into the landfill. The excess infiltration of precipitation would result in leachate being generated and contaminating the groundwater.

Alternative 4A: The selection of this alternative will incorporate a more protective cap by providing a thicker or deeper protective layer soil layer, resulting in better vegetative rooting, thus less precipitation infiltration into the landfill. Freeze-thaw protection of the GCL layer would also be enhanced. This option is expected to provide for the necessary long-term effectiveness and permanence required by the nine evaluation criteria.

Alternative 5: This cap design would comply with the required regulations for landfill cap design that are designed to achieve long-term effectiveness and permanence.

Reduction of Toxicity, Mobility, or Volume through Treatment

Reduction of toxicity, mobility, or volume through treatment refers to the anticipated performance of the treatment technologies that may be included as part of a remedy.

The leachate collected at the landfill via gravity flow wells will be either treated onsite or transported offsite for treatment at a permitted wastewater treatment facility. Landfill gas can be treated by both venting and flaring (combustion) on site:

The natural treatment involved in all the alternatives is the capacity of the soils in the GMZ north of the landfill to effectively naturally attenuate the groundwater contamination before contamination, above regulated levels, reaches the Kishwaukee River. For natural attenuation to effectively occur, not only must the soil be capable to do the work, but also the source of the contamination must be effectively contained, such as through the construction of an appropriate landfill cap. The appropriate landfill cap would limit water (i.e., rain, snow) infiltration into the landfill, thus reducing leachate generation to manageable levels. In addition, all alternatives, except for Alternative 1, include the installation of additional leachate and gas removal. With the appropriate cap coupled with leachate and gas removal technologies, the volume and mobility of leachate and gas should be reduced, thus also reducing the migration of contaminants to groundwater.

Alternatives 1, 2A and 3A: Alternative 1 would not meet this criterion. Alternatives 2A and 3A would not be able to meet this criterion if the thickness, permeability and long-term integrity of the cap are questionable as to their adequacy.

Alternatives 2B, and 3B: Alternatives 2B and 3B would probably meet this criterion in the short-term, but may be not in the long-term if there is cap integrity problems.

Alternative 4: Alternative 4 would most likely meet this criterion, if the long-term integrity of the landfill cap can be maintained.

Alternative 4A: Alternative 4A would meet this criterion, since it would reduce the infiltration of precipitation through the use of a cap which offers greater long-term effectiveness and permanence.

Alternative 5: Alternative 5 should meet this criterion, as described above.

Short-Term Effectiveness

Short-term effectiveness addresses the period of time needed to implement the remedy and any adverse impacts that may be posed to workers, the community and the environment during construction and operation of the remedy until cleanup levels are achieved.

Alternative 1: Since no additional remedial actions would be performed, short-term risks could occur to trespassers if they entered the surface impoundment. Therefore this alternative does not provide adequate short-term effectiveness.

Alternatives 2A-5: Construction of the final cover system, including leachate and gas withdraw scenarios, include the potential for exposure of waste and direct contact by construction workers on-site. There is also the potential for the limited release of landfill gas and volatilization of organic compounds into the atmosphere, which could potentially affect downwind residences. Possible exposures would be minimal and monitored. Alternatives 2A-5 should meet the short-term effectiveness criterion. Generally all of the alternatives could be constructed in 9 months or less, if started early in the construction season (Spring) and no weather related problems occurred.

Implementability

Implementability addresses the technical and administrative feasibility of a remedy from design through construction and operation. Factors such as availability of services and materials, administrative feasibility, and coordination with other governmental entities are also considered.

Alternatives 2-5 for capping and the other common components for site remediation all involve commonly used construction materials and techniques for Superfund landfills. There are issues associated with the construction of Alternatives 2A-5 for the side slope cap construction due to the close proximity of the adjoining property boundaries and railroad and utility right-of-ways. In order to completely cover the delineated extent of buried refuse and maintain the required grading contours to properly promote surface water runoff, the final cover would have to extend very close, or into, the railroad and utility right of ways for all alternatives. For those alternatives without a final protective soil layer (2A, 3A, and 4) the perimeter of the cap would not extend as far as Alternatives 2B, 3B, or 5. Alternative 4A will be designed to include an adequate protective soil layer with a final cover that stays within the property boundaries. For the northern landfill slope and property boundary where the cap would extend up to on into the railroad and utility right-of-ways, if these constraints cannot be resolved, the following options to completing the cap construction are available:

- Construction of a retaining wall or use of sheet piling to a height sufficient to contain the extended cap layers at the property boundaries.
- Contour the cap construction in such a manner that it terminates at the property boundary, and place a GCL and a lesser amount of soil cover over any portions of delineated refuse not directly covered by the final cap.
- Excavate a sufficient amount of refuse along the northern side of the landfill to allow the final cap perimeter and necessary surface water diversion ditches to be constructed within the property boundary, and reconsolidate the excavated refuse beneath the final cap along flatter side slopes within other portions of the landfill.

Cost

The costs for the various alternatives are given along with the descriptions of each individual alternative. There are considerable differences in the prices for the alternatives within each operable unit. Note that some of the alternatives may have a relatively large capital (initial) cost but a small yearly operating cost; or an alternative may have a small capital cost but a relatively large operating cost. The most effective way of evaluating these costs is to use the alternatives' "Net Present Value."

The Net Present Value Costs estimates range from \$13,748,624 for Alternative 2A to \$21,719,025 for Alternative 5. These costs include Cap Construction Cost, Total Capital Cost, and Net Present Value of Operation and Maintenance Cost. Included in the Total Capital Cost are the following: installation of monitoring systems, leachate collection beds, and gas collection system, as well as surface impoundment closure.

Alternative 1: Cost would be limited to the remedial working already performed on and near the site.

Alternative 2A: The estimated total cost is \$13,748,624. The lowest except for Alternative 1.

Alternative 2B: The estimated total cost is \$20,387,108. The cost associated with this alternative is the second highest overall.

Alternative 3A: The estimated total cost is \$18,227,056. This cost falls within the high end of the mid-range of costs.

Alternative 3B: The estimated total cost is \$21,719,025. This cost is the highest cost of all the available options.

Alternative 4: The estimated total cost is \$16,829,193. This cost is at the high end of the low range for the options.

Alternative 4A: The estimated total cost is \$17,475,193. This cost is approximately within the middle of all estimated costs for the available options.

Alternative 5: The estimated total cost is \$18,792,446. This cost is at the low end of the high range for the options.

Support Agency Acceptance

The United States Environmental Protection Agency concur with the selected remedy. Illinois EPA presently has the technical lead role, with the federal government providing the enforcement lead role during the RI/FS, PP and ROD process. Starting with the RD/RA, the Illinois EPA will have both the technical and enforcement leads.

Community Acceptance

The surrounding community accepts the remedy selected. The reaction to the remedy is further described in the Responsiveness Summary at the end of this Record of Decision.

XI. Principal Threat Wastes

The NCP establishes an expectation that USEPA will use treatment to address the principal threats posed by a site wherever practicable (NCP Section 300.430(a)(1)(iii)(A)). Identifying principal threat wastes combines concepts of both hazard and risk. In general, principal threat wastes are those source materials considered to be highly toxic or highly mobile which generally cannot be contained in a reliable manner or would present a significant risk to human health or the environment should exposure occur. Conversely, non-principal threat wastes are those source materials that generally can be reliably contained and that would present only a low risk in the event of exposure. The MIG/DeWane landfill does not contain principal threat wastes.

Wastes that generally will be considered to constitute principal threats include, but are not limited to, the following:

Liquid source material - waste contained in drums, lagoons or tanks, free product in the subsurface (i.e., NAPLs) containing contaminants of concern (generally excluding groundwater).

Mobile source material - surface soil or subsurface soil containing high concentrations of chemicals of concern that are (or potentially are) mobile due to wind entrainment, volatilization (e.g., VOCs), surface runoff, or subsurface transport.

Highly-toxic source material - buried drummed non-liquid wastes, buried tanks

containing non-liquid wastes, or soils containing significant concentrations of highly toxic materials.

Wastes that generally will not constitute principal threats include, but are not limited to, the following:

Non-mobile contaminated source material of low to moderate toxicity - surface soil containing chemicals of concern that generally are relatively immobile in air or ground water (i.e., non-liquid, low volatility, low leachability contaminants such as high molecular weight compounds) in the specific environmental setting.

Low toxicity source material - soil and subsurface soil concentrations not greatly above reference dose levels or that present an excess cancer risk near the acceptable risk range were exposure to occur.

The MIG/DeWane landfill site does not contain principal threat wastes. This landfill is a Type I landfill as is described in the U.S. EPA guidance document, *Conducting Remedial Investigations/Feasibility Studies for CERCLA Municipal Landfill Sites* (EPA/540/p-91/001, February 1991).

XII. Summary of Selected Remedy

Summary of Rationale for the Selected Remedy

As stated previously, the selected remedy uses numerous common remedial components for the leachate collection and monitoring system, for the landfill gas collection and monitoring system, for the leachate surface impoundment closure, the site surface water diversion system, the implementation of access restrictions and institutional controls, the natural attenuation of groundwater, and long-term groundwater monitoring. The nine criteria served as the basis for conducting the alternative screening and detailed analysis. The chosen remedy provides the best balance of tradeoffs with respect to the balancing and modifying criteria. The chosen landfill cap alternative, 4A, along with the identified common non-cap remedial action components provide the best option for providing an appropriate level of containment and long-term overall protection of human health and the environment.

Description of the Selected Remedy

The selected remedy is the common non-cap remedial action components and the Alternative 4A cap. The non-cap and cap Alternative 4A remedial actions include the following:

- Construction and operation of a leachate collection and monitoring system.

- Construction and operation of an active and passive landfill gas collection system and monitoring program.
- Leachate surface impoundment closure.
- Surface water diversion system.
- Implementation of access restrictions and institutional controls.
- Natural attenuation of groundwater.
- Long-term groundwater monitoring.
- Construction of a new cap over the entire landfill to minimize the infiltration of precipitation into the landfill.

This remedy is an improvement over Alternative 4 due to the following two differences:

- (1) Alternative 4A provides for an increase in the overall soil cover depth from the eighteen inches to thirty inches on the landfill crest and a tapering of the soil depth from thirty inches at the top of the side slopes, down to twenty-four inches at the landfill toe; and
- (2) The backfilling and covering of the side slopes with a twelve-inch minimum depth compacted subsoil/grading layer.

Although Alternative 4 does specify that a grading layer will be placed, it provides for neither a minimum soil depth, nor compaction requirements. The components of Alternatives 4A, with the identified soil depth modifications, are described below, along with a brief explanation of the advantages over the other listed alternatives.

The Alternative 4A landfill cover alternative, with its soil depth modifications, was chosen, in part, to insure adequate reduction of groundwater infiltration into the landfill, thus reducing leachate and landfill gas generation, and reducing the contamination of groundwater by leachate. It was also chosen because Alternative 4A is more protective of the GCL than Alternative 4, while not being as costly as the Alternative 5 landfill cover. The Alternative 4A landfill cap comprises a 2 1/2-foot soil protection and vegetative layer on the crest of the landfill with a taper to a 2-foot protection layer at the toe of the slope. In addition, a geosynthetic (geonet and geotextile) drainage layer, a composite barrier layer consisting of a geosynthetic clay liner between a geosynthetic flexible membrane and a geotextile layer will be required. These layers will be placed over the older interim two feet thick soil cover that already exists on the landfill crest and a subsoil/grading layer for a subgrade to be placed on the side-slopes.

Up to six inches of the cover clay from the existing cap will be removed and stockpiled for use as material for the final capping of the landfill side-slopes. The remainder of the older interim two feet compacted soil cover will be regraded and repaired as is necessary to provide a proper base for and the protection of the other cover layers to be included in the cover system. The landfill slide-slopes will be backfilled as necessary to cover exposed refuse, repair erosion gullies, and to mitigate leachate seeps. A compacted soil layer, with a minimum depth of twelve inches will comprise the subsoil/grading layer to establish a protective base or foundation for the GCL components. The existing interim cap on the crest of the landfill will be recompacted.

A soil foundation layer will be constructed across the landfill at a level immediately beneath the cover system hydraulic barrier layer. The functions of this layer are to cover exposed waste, achieve required final grades, provide a smooth, firm foundation for overlying cover system components, protect cover system components from buried waste, and support construction equipment with minimal rutting. Required foundation material property, layer thickness, and compaction requirements, subgrade proofrolling, requirements, required grades and construction tolerances and other necessary design criteria to demonstrate acceptable layer performance will be established through the use of guidance documents, pre-design studies and the remedial design process. This will be done in order to provide a firm soil foundation suitable for installing the final landfill cover, which will consist of the GCL, drainage layer, protective layer and vegetative layer.

As part of the remedial design, Interim Remedial Measures (IRM) cap material or underlying grading fill may be considered for use as foundation layer material for the landfill side slopes. Soil material from the top of the landfill will only be used for this purpose to the extent that the remaining cap material thickness satisfies all applicable design criteria including all foundation layer criteria, permeability criteria as appropriate, and final grading criteria. In no case will the post-excavation IRM cap material thickness on top of the landfill be less than twelve inches. After soil removal, the surface of the remaining soil will be graded, scarified, moisture conditioned if necessary, and compacted to satisfy the engineering specifications developed during the remedial design.

The side slope soil cover and grading layer will protect the other cover layers from possible damage from the landfill's contents, freeze-thaw, intrusion (animal and human), root penetration, and vegetative growth. The cover will also serve to provide slope stability. ARARs pertaining to the 35 Ill. Adm. Code require a minimum of two feet compacted soil on side slopes (807) and more for 811.314 (c). The final grading of the total cover system will result in a slope no less than 3.0%.

Summary of Estimated Remedy Costs

The cost for the selected alternative is reproduced below primarily from the Feasibility Study. The only changes from the original table is the amount of topsoil needed for cap construction.

Feasibility Study Cost Estimate
Alternative Number 4A
MIG/DeWane Landfill / Belvidere, Illinois

Remedial Task	Quantity	Unit	Unit Cost	Total Cost	Subtotal	Cost Basis
A. Leachate Piezometer and Gas Probe						
<i>Installation</i>						
Mobilization	1	lump sum	\$1,500	\$1,500		Two mobilizations required
Leachate Piezometer Installation	8	each	\$5,000	\$40,000		Approx. 50 ft in depth
Landfill Gas Monitoring Well Nests (two each)	6	each	\$3,500	\$21,000		Approx. 15 and 25 ft in depth
Decontamination Equipment	12	days	\$300	\$3,600		
Geologist Oversight	15	mandays	\$1,500	\$22,500		
Total Cost for Monitoring Systems					\$88,600	
B. Cap Construction						
Surface Water Diversion Ditches	2,500	linear feet	\$25	\$62,500		Along RR track and borrow pit
Erosion Controls	1	lump sum	\$15,000	\$15,000		Primarily silt fencing required
Pipe Surface Water Runoff to Kishwaukee River	1,500	linear feet	\$60	\$90,000		Assumes direct routing to north
Discharge Structure	1	lump sum	\$25,000	\$25,000		
Side Slope Grading	40,000	cubic yards	\$12	\$480,000		Assumes uniform runoff
Geodrainage Net	2,041,000	square feet	\$0.70	\$1,428,700		Side slopes and crest
Geosynthetic Clay Liner	2,041,000	square feet	\$0.90	\$1,836,900		Covers delineated refuse
Geotextile Fabric	2,041,000	square feet	\$0.45	\$918,450		Side slopes and crest
Topsoil (2.5 feet)	166,067	cubic yards	\$15	\$2,491,000		Side slopes and crest
Seeding	52	acres	\$2,200	\$114,000		
Total Cost for Cap Construction					\$7,461,950	
C. Leachate Bed Construction						
Leachate Drain Beds	50,000	square feet	\$6	\$300,000		Upper portions of major seeps
Leachate Drainage Piping	3,000	linear feet	\$12	\$36,000		Routed to sumps

Sump Stations	3	each	\$11,000	\$33,000		Located at toe of landfill
Force Main Piping to Belvidere POTW (Note 1)	5,000	linear feet	\$17	\$85,000		Tie-in along BR US20
Sewer Tie-In	1	lump sum	\$10,000	\$10,000		Includes sampling manhole
Leachate Storage Tanks (30,000 gals)	2	each	\$78,000	\$156,000		Includes automated monitoring
Leachate Disposal (Note 1)	1,200,000	gallons	\$0.50	\$600,000		120,000 gals/yr avg for 10 yrs
Total Cost for Leachate Beds					\$1,220,000	
D. Gas Collection System						
Passive Vent Wells	17	each	\$5,000	\$85,000		Approx. 50 ft depth
Wellhead Completion	17	each	\$2,000	\$34,000		
Passive Trench	1,500	linear feet	\$200	\$300,000		Approx 25 ft depth
Total Cost for Gas Collection					\$419,000	
E. Closure of Surface Impoundment						
Removal and Disposal of Liquids	300,00	gallons	\$0.25	\$75,000		
Excavation of Sediments/Consolidation	650	cubic yards	\$25	\$16,250		Approx. 1 to 2 ft depth
Backfill to Grade	6,000	cubic yards	\$12	\$72,000		Native soils backfilled to grade
Total Cost for Impoundment Closure					\$163,250	
F. Engineering and Construction Costs						
Permitting and Legal Fees (1%) (Note 2)				\$113,188		
Mobilization / Demobilization (2%)				\$174,136		
Engineering Design (10%)				\$957,748		
Health and Safety (3%)				\$261,204		
Engineering Oversight (5%)				\$348,272		
Bonding and Insurance (3%)				\$261,204		
Construction Management (7%)				\$609,476		
Cap Construction QA/QC (1.5%)				\$130,602		
Construction Overhead and Profit (15%)				\$1,306,020		
Contingency (10%) (Note 3)				\$870,680		
Total Indirect Capital Costs					\$5,032,530	
G. Annual Operation and Maintenance						

Groundwater, Leachate, Gas Monitoring (Note 4)	1	annual	\$40,000	\$40,000		Annual sampling of each well
Well Replacement, Repairs, Redevelopment	1	lump sum	\$15,000	\$15,000		10 yr life cycle for each well
General Facility Maintenance	4	quarters	\$3,000	\$12,000		Basic road, fencing repairs, etc
Cap Inspection and Maintenance	4	quarters	\$6,000	\$24,000		Major repairs will not be required
Passive Gas Vents Inspections/Repairs (Note 5)	1	lump sum	\$20,000	\$20,000		10 yr life cycle for each well
Passive Trench Inspections/Repairs	1	lump sum	\$15,000	\$15,000		10 yr life cycle for each trench
Landscaping	100	acres	\$150	\$15,000		Mowing, fertilizing, etc.
Reporting/Project Management	1	lump sum	\$60,000	\$60,000		
Total Annual O&M Cost					\$201,000	
Net Present Value for Annual O&M					\$3,089,862	5% discounted over 30 years
TOTAL NET PRESENT VALUE COST FOR ALTERNATIVE 4					\$17,475,193	

NOTES:

(1) The leachate disposal cost estimates are based on continuing transportation to the Rockford POTW. Pretreatment costs are not included, since a permit is already in place to transport leachate to the Rockford POTW, and pretreatment has not historically been required (i.e., leachate constituents did not exceed applicable pretreatment criteria). The cost for a forcemain to the Belvidere POTW was also included in the event approval can be obtained to directly discharge leachate to that treatment plant for a comparable unit cost without pretreatment.

(2) The actual percentages used to determine the "Permitting and Legal Fees" and "Engineering Design" line items were adjusted slightly upward, and the actual percentage used for the "Engineering Oversight" line item adjusted slightly downward, from the indicated percentages to allow for proper comparison versus the other remedial alternatives.

(3) A contingency of only 10% has been used given the conservative unit costs used for each line item.

(4) For simplicity in determining net present value, the monitoring costs are based on the annual sampling of up to 20 groundwater monitoring wells and the existing leachate and gas monitoring wells. The FFS text describes quarterly monitoring for the first two years and annual sampling thereafter. The costs associated with the six extra sampling events over the first two years were distributed over the 30-year discounting period and then added to the annual cost. In actuality, the annual monitoring cost is comprised of \$32,000 for the annual monitoring requirements, and an additional \$8,000 distribution from the extra six monitoring events to be performed during the first two years. The annual monitoring costs include the following: a two-person sampling crew in the field for three days; an extra three field days throughout the year to take quarterly water level measurements; analysis of the 22 groundwater and leachate samples for VOCs, metals, and water quality parameters according to RI protocol; analysis of both gas samples for VOCs. Reporting costs are included in the "Reporting/Project Management" line item.

(5) Quarterly monitoring costs for the landfill gas collection system are included in this line item. Gas probes will be monitored using field instrumentation for % LEL, % methane, % oxygen, % carbon dioxide, and total VOCs using a PID or FID.

Expected Outcomes of the Selected Remedy

Land use for the site during the last thirty years has been for refuse disposal. Prior to the site becoming a landfill it was used to extract sand and gravel, and for agricultural purposes. The expected future land use will be restricted with no development because the site is a landfill, and because of the type of final cap to be installed. Land use for the soil borrow-pit to the west will continue to be restricted. Its present use is already restricted due to the fact that it is a soil borrow

area pit. Deed restrictions prohibit all residential development of the site and all uses of groundwater. The soil borrow pit area also presently contains the landfill gas interceptor trench, gas extraction wells, gas probes and groundwater monitoring wells. The agriculture field to the north is part of a planned GMZ for contaminated groundwater. Boone County Department of Health ordinances prohibit installation of groundwater drinking wells in the flood plain. The agricultural field presently has use restrictions because it is within the flood plain of the Kishwaukee River and Boone County zoning ordinances restricts development. City water is provided to the residential development downgradient and west of the landfill.

Groundwater use offsite is restricted as is mentioned above. If further restrictions are needed they will be required as part of the final remedy. The time frame to achieve cleanup for offsite groundwater to Class I groundwater quality criteria ARARs is expected to range from 13 to 26 years for West Glacial Pathway for both the planned and contingent leachate removal scenarios, and using natural attenuation. For the North Interface Pathway the time for cleanup ranges from 54 to 108 years, depending on the leachate removal scenarios. For the planned leachate removal scenario, it is estimated that groundwater remediation will occur in a range from 81 to 108 years. However, under the contingent leachate removal scenario groundwater remediation is estimated to range from 54 to 81 years. Upon achieving cleanup levels to Class I criteria, groundwater use may continue to be restricted to agricultural and industrial use, depending on local ordinances. The use of onsite groundwater, and as necessary, offsite groundwater will be prohibited by deed restrictions. The time frame to remove and reduce methane gas to safe and ARAR (35 IAC 811) compliant levels from the area of the subdivision was estimated to be less than one year during the 1999 emergency response action. The time frame estimated for reducing landfill gas migrating from the landfill down to acceptable ARAR levels is not certain, but landfill gas generation rates have been declining since 1988.

The final cleanup level for each identified medium of concern that are expected to occur based on the chosen remedial alternative and its various components is described below. Although groundwater had not been identified in either the RI or baseline risk assessment as a media of concern, low levels of various constituents and some VOCs were detected in down gradient groundwater. The final clean up levels for each contaminant in offsite groundwater will be the appropriate MCLs, ARAR, or similar mandated or recommended level for each COC. The offsite migration of landfill gas has been undergoing emergency response remediation since early May 1999. Since that time, the offsite migration of landfill gas to the west towards the subdivision has been significantly reduced. Gas remediation will continue until as long as necessary to be protective of human health, and the environment. In general, compliance with the groundwater and solid waste ARARs that relate to landfill gas will meet this requirement.

The anticipated socio-economic and community revitalization impacts of the selected remedy is unknown at this time. The anticipated environmental and ecological benefits are the cleaning up of groundwater to Class I criteria and the protection of surface waters such as the Kishwaukee River, as well as the adjacent wetlands.

XIII. Statutory Determinations

Under CERCLA Section 121 and the NCP, the lead agency must select remedies that are protective of human health and the environment, attain Federal and State requirements that are applicable or relevant and appropriate for this remedial action (or invoke an appropriate waiver), are cost-effective, and utilize permanent solutions and alternative treatment technologies (or resource recovery) to the maximum extent practicable. In addition, CERCLA includes a preference for remedies that employ treatment that permanently and significantly reduces the volume, toxicity, or mobility of hazardous wastes as a principal element and a bias against off-site disposal of untreated wastes.

Protection of Human Health and the Environment

Alternative 4A will be protective of human health and the environment. The reduction of precipitation into the landfill would be expected to be between 97% and 99%. The cap will be protective of human health and the environment and play a major role in cleaning the groundwater ultimately to Class I groundwater criteria levels, by effectively reducing leachate generation and contaminant migration. This cap option provides an adequate protective soil layer depth for the GCL component of the cap against the effects of freeze-thaw cycles, thus maintaining cap integrity.

Compliance with Applicable or Relevant and Appropriate Requirements

The selected remedy is comprised of a variety of ongoing actions including leachate collection and treatment, landfill gas collection, residential gas collection, installation of a permanent protective landfill cap, and treatment of groundwater through monitored natural attenuation. These actions will comply with all ARARs. The ARARs identified in the Feasibility Study are reproduced below.

TABLE 4-1

Initial Screening of Potential ARARs & TBCs

State and Federal Requirements and Prerequisites for Applicability

MIG/DeWane Landfill / Belvidere, Illinois

DESCRIPTION	REQUIREMENTS AND PREREQUISITES FOR APPLICABILITY	CITATION
<i>LOCATION-SPECIFIC ARARs & TBCs</i>		
Within Floodplain	Actions to avoid adverse effects, minimize potential harm, or restore and preserve natural and beneficial values in the event remedial construction activities impact and identified floodplain area. The actions will occur	Protection of floodplains (40 CFR 6, Appendix A); Fish and Wildlife Coordination Act (16 USC 661 et seq.); 40

	<p>in a floodplain including lowlands, relatively flat areas adjoining inland and coastal waters, and other flood prone areas. The landfill construction shall not restrict the flow of a 100-year flood, result in washout of</p> <p>solid waste from a 100-year flood, or reduce the temporary water storage capacity of the 100-year floodplain.</p>	<p>CFR 6.302; Exec. Order No. 11988; 93 IAC 708, IL Rev. Stat., CH 19; 35 IAC 811; Boone Co. Ordinance No. 88-02</p>
General Use Water Quality Standards	General use standards protect the waters of the State for aquatic life, agricultural use, primary and secondary contact use, most industrial use, as well as ensure the aesthetic quality of the State's aquatic environment.	35 IAC 302.208
Air Quality Standards	Ambient air quality standards to be maintained at all times.	35 IAC 243
Air Emissions from Landfill Gas Collection Operations	<p>National primary and secondary ambient air quality standards (NAAQS) for sulfur dioxide, particulate matter, carbon monoxide, volatile organic compounds (ozone), and nitrogen dioxide. Air emissions of these</p> <p>Parameters shall not cause an exceedance of these standards.</p>	40 CFR 50, 60; 35 IAC 214, 215, 216, 217
Area Affecting Stream or River	Actions to protect fish or wildlife. Applies when diversion, channeling, or other activity that modifies a stream or river affects fish or wildlife.	Fish and Wildlife Coordination Act; 40 CFR 6.302
Wetlands	Site-specific operating permit requirements for activities which impact wetlands.	U.S. Army Corps of Engineers permit
Endangered Species	Requires actions to conserve endangered species within critical habitats upon which endangered species depend. Includes consultation with the Department of the Interior.	16 USC 1531; 50 CFR 200
ACTION-SPECIFIC ARARs & TBCs		
A. REMEDIAL CONSTRUCTION RELATED	The following are requirements related to remedial action construction activities.	
Occupational Safety and Health Act	Regulates worker health and safety during remedial construction activities.	29 U.S.C. 651-678; 29 CFR 1910, 1926
American Council of Governmental Industrial Hygienists (ACGIH)	Establishes safety and allowable worker exposure standards for use in remedial construction activities.	Threshold Limit Values
Visual Emission Standards and Limitations	Emission standards for stationary sources and fuel combustion emission systems.	35 IAC 212

Mobile Air Pollution Standards	Motor vehicle air emission standards.	35 IAC 240
Particulate Criteria for Stationary Sources	Particulate matter is not to be emitted into the atmosphere which exceeds allowable emission levels. Fugitive particulate matter from any storage or material handling process including truck loading, conveyors, Stockpiles, etc. during construction must be controlled.	35 IAC 212
Noise Limitations for Motor Vehicles	Regulation applicable to all motor vehicles in Illinois.	35 IAC 902
Stormwater Management	Stormwater management during construction activities.	40 CFR 122.44; 35 IAC 811
Monitoring Well Construction	Establishes the minimum requirements for the construction of monitoring wells.	77 IAC 920
Sealing of Drilling Boreholes	Establishes minimum requirements for plugging and sealing of boreholes.	35 IAC 811
B. AIR MISSIONS RELATED	The following are requirements related to air emissions during long-term operation of the landfill gas collection system.	
National Emission Standards for Hazardous Air Pollutants (NESHAPs) and (HAPs)	Identifies HAPs and sets NESHAPs on an industry, process, or chemical-specific basis. Includes monitoring, testing, reporting, and recordkeeping requirements for each.	40 CFR 61, 63, 70; 35 IAC 243
Landfill Gas Management	<p>Design gas collection system for odor free operation.</p> <p>Control of emissions from equipment, including particulate matter, sulfur, organic material, carbon monoxide, and nitrogen oxides.</p> <p>File an Air Pollution Emission Notice (APEN) with State to include estimation of emission rates for each pollutant expected.</p> <p>Establishes odor criteria to identify odorous offsite emissions which must be controlled.</p>	<p>40 CFR 52</p> <p>35 IAC 211, 212, 214, 215, 216, 217</p> <p>40 CFR 52</p> <p>35 IAC 245</p>
Construction and Operating Permit Requirements for Emission Sources	Persons shall not discharge any contaminant into the environment causing air pollution in Illinois. A construction and operations permit is required for construction or modification of any emission source.	35 IAC 201
C. RESIDUALS DISPOSAL RELATED	The following are requirements related to the disposal of residual material from soil and sediment excavation, or sludges or other residuals generated from leachate pretreatment system operations.	

Identification and Listing of Hazardous Waste	Defines those solid wastes which are subject to regulation as hazardous wastes.	40 CFR 261; 35 IAC 721
Hazardous Waste Generation, Storage and Disposal	<p>Site must obtain a USEPA identification number.</p> <p>Generator use and management of hazardous waste containers must meet treatment facility requirements.</p> <p>Generator tank storage of hazardous waste must meet design and storage requirements for treatment facilities, excluding closure requirements.</p> <p>Temporary onsite storage of hazardous waste for offsite disposal.</p> <p>Temporary storage of excavated soils and sediments in surface waste piles must meet requirements for treatment facilities. Ensure that hazardous constituents are contained or immobilized within the waste pile.</p>	<p>40 CFR 262; 35 IAC 722</p> <p>40 CFR 264 Subpart I; 35 IAC 724</p> <p>40 CFR 264 Subpart J; 35 IAC 724</p> <p>35 IAC 722</p> <p>40 CFR 264 Subpart L; 35 IAC 724</p>
Hazardous Materials Transportation Regulations	Regulates transportation of hazardous materials under DOT regulations, hazardous wastes under EPA regulations, and special wastes under Illinois EPA regulations.	49 CFR 107, 171-177 and 40 CFR 263; 35 IAC 722, 723, 724
Transportation of Hazardous Substances	IDOT requirements for transportation over Illinois highways.	92 IAC 171, 172, 173
Special Waste Hauling	Applies to all hauling of special wastes under Illinois EPA regulations.	35 IAC 808, 809
Haulage Limitations on Roadways	Oversized vehicles need a permit to travel on roadways.	IDOT Dir. of Highways Sec. 15 Ill. Vehicle Code based on Federal Bridge Formulas
Placement of Hazardous Waste in Land Disposal Unit	Specific land disposal restrictions associated with the placement of RCRA hazardous waste in a landfill, surface impoundment, waste pile, injection well, land treatment facility, salt dome formation, or underground mine or cave.	40 CFR 268 (Subpart D)
D. SOLID WASTE/ LANDFILL DISPOSAL	The following requirements apply to the implementation of a final remedy, as well as the individual components of the remedial action. Potentially applicable Illinois solid waste/landfill regulations are noted.	
Previously Closed Landfills	Provides requirements for solid waste permits, sanitary landfill requirements, closure and post closure care, and financial assurance for Municipal Solid Waste Landfills (MSWLFs) closed prior to 1990.	35 IAC 807
Existing Landfills Still Operating	Provides requirements for solid waste permits, sanitary landfill requirements, closure and post closure care, and financial assurance for existing MSWLFs prior to 1990 which are still operating.	35 IAC 814

New Landfills	Provides requirements for solid waste permits, sanitary landfill requirements, closure and post closure care, and financial assurance for new MSWLFs after 1990.	40 CFR 258; 35 IAC 811
<i>E. LEACHATE DISCHARGE RELATED</i>	The following are requirements related to the treatment and discharge of leachate.	
Permit for the Construction and Operation of Treatment Works	Illinois EPA permit requirements for construction and operation of treatment and pretreatment systems and the corresponding discharge authorization.	35 IAC 309
Discharge to Publicly Owned Treatment Works (POTW)	Pretreatment standards for discharge; includes prohibitions on the discharge of pollutants that pass through the POTW without treatment, interfere with POTW operation, contaminate POTW sludge, or	40 CFR 403; 35 IAC 307, 310
	Endanger health/safety of POTW workers.	
	Criteria for monitoring of treated water at a POTW.	35 IAC 304
	City of Belvidere and Rockford POTW pretreatment requirements.	Local POTW regulations
Leachate Storage	Underground storage tank design, construction, installation, and operational requirements.	40 CFR 280; 35 IAC 170
<i>CHEMICAL-SPECIFIC ARARs & TBCs</i>		
Safe Drinking Water Act	Establishes primary and secondary maximum contaminant levels (MCLs), which are enforceable standards of maximum permissible levels of contaminants in drinking water from a public water source.	40 U.S.C. 300; 40 CFR 141, 143
Maximum Contaminant Level Goals	Establishes drinking water quality goals set at levels of no known or anticipated adverse health effects, with an adequate margin of safety.	Pul. L. No. 99-339, 100 Stat. 642 (1986); 40 CFR 141
Illinois Groundwater Quality Standards	Establishes groundwater classes and chemical-specific water quality standards for the State of Illinois. Also provides for determination of a health advisory for other chemicals and mixtures.	35 IAC 620
General Use Water Quality Standards	General use standards protect the waters of the State for aquatic life, agricultural use, primary and secondary contact use, most industrial use, as well as ensure the aesthetic quality of the State's aquatic environment.	35 IAC 302
Ambient Water Quality Criteria	Sets criteria for water quality based on toxicity to aquatic organisms and human health.	40 CFR 131; Quality Criteria for Water, 1976, 1980, 1986

Cost-Effectiveness

In the judgement of Illinois EPA, the selected remedy is the most cost-effective. In making this determination, the following definition was used: "A remedy shall be cost effective if its costs are proportional to its overall effectiveness." (NCP Section 300.430(f)(1)(ii)(D)). This was accomplished by evaluation the "overall effectiveness" of those alternatives that satisfied the threshold criteria (i.e., were both protective of human health and the environment and ARAR compliant). Overall effectiveness was evaluated by assessing three of the five balancing criteria in combination (long-term effectiveness and permanence; reduction in toxicity, mobility, and volume through treatment; and short-term effectiveness). Overall effectiveness was then compared to costs to determine cost-effectiveness. The relationship of the overall effectiveness of this remedial alternative was determined to be proportional to its costs and hence this alternative represents a reasonable value for the money to be spent. Alternative 4A meets the nine criteria, complies with ARARs, and with a cost that is in the mid-range of the various remedial options.

The total estimated cost for the project is approximately \$17,475,193.00.

Utilization of Permanent Solutions and Alternative Treatment Technologies (or Resource Recovery Technologies) to the Maximum Extent Practicable

Illinois EPA has determined that the selected remedy represents the maximum extent to which permanent solutions and treatment technologies can be utilized in a practicable manner at the site. Of those alternatives that are protective of human health and the environment and comply with ARARs, Illinois EPA has determined that the selected remedy provides the best balance of trade-offs in terms of the five balancing criteria, while also considering the statutory preference for treatment as a principal element, bias against off-site treatment and disposal, and considering community acceptance.

The Selected Remedy effectively meets landfill containment requirements by limiting infiltration of surface water into the landfill and thus achieving significant reductions in COC volumes leaving the landfill, and the COC concentrations in the groundwater. The selected remedy does not present short-term risks different from the other treatment alternatives. There are no special implementability issues that set the selected remedy apart from any of the other alternatives evaluated.

Preference for Treatment as a Principal Element

Part of the selected remedy involves collecting the leachate and treating it offsite. By utilizing treatment as part of the remedy, the statutory preference for remedies that employ treatment as a principal element is satisfied.

Five-Year Review Requirements

Because this remedy will result in hazardous substances, pollutants, or contaminants remaining on-site above levels that allow for unlimited use and unrestricted exposure, a statutory review will be conducted within five years after initiation of remedial action to ensure that the remedy

continues to be protective of human health and the environment.

XIV. Documentation of Significant Changes

The Proposed Plan was released for public comment in July, 1999. It identified Alternative 4A as the preferred alternative. The Alternative 4A landfill cover alternative, with its soil depth modifications, was chosen, in part, to ensure an adequate reduction of groundwater infiltration into the landfill, thus reducing leachate and landfill gas generation, and reducing the contamination of groundwater by leachate.

The original Alternative 4A provided for thirty inches of protective soil cover over the GCL layer on the landfill crest and tapering to twenty-four inches at the toe of the landfill slope. Presently on the landfill the interim cap is twenty-four inches of compacted soil cover on the crest and approximately six inches of noncompacted soil on the slopes. The Illinois EPA originally was requiring a grading/foundation layer of eighteen inches of compacted soil on the side slopes. After additional Illinois EPA evaluation, it was determined that a minor modification to the technical aspects of the remedy could be effected without sacrificing overall protection of human health and the environment, or ARAR compliance. The twenty-four inch interim cap on the landfill crest will be used as the foundation layer. A maximum of six inches of soil from the existing cap will be removed from the crest to add to the side slopes to bring the side slope foundation layer depth up to a minimum total of twelve inches compacted soil prior to the placement of the remaining components of the cap (i.e., geosynthetics and soil).

The contingent remedies for groundwater, depending on the baseline risk assessment addendum, may result in a significant change. The addendum's impact on the potential risks's associated with the COCs concentrations in groundwater west of the landfill will not be more fully known (and thus its significance) until after the document is completed later in 2000.

**MIG/DeWane Landfill
Superfund Site
Belvidere, Illinois**

**Responsiveness Summary
for the
Proposed Remedial Alternative**

**Illinois Environmental
Protection Agency**

March 2000

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AGENCY DECISION

The Illinois Environmental Protection Agency (Illinois EPA) prefers remedial alternative 4A which is detailed on page 9.

HISTORY BACKGROUND

The MIG/DeWane Superfund site (also known as Boone County landfill, Bonus landfill, or Kennedy landfill) is located in Boone County approximately 0.25 miles east of the city of Belvidere, Illinois and 0.5 miles north of Business U.S. Route 20. Primarily located in the south half of the southeastern quarter of Section 30, Township 44 North, Range 4 East of the Third Principal Meridian. The landfill covers an area of approximately 47 acres.

From 1969 through 1988, the landfill accepted approximately 3.7 million cubic yards of household or residential, municipal, commercial, and industrial waste. In 1984, the United States Environmental Protection Agency (U.S.EPA) conducted a sampling inspection of the landfill to evaluate it for Superfund consideration. In 1985, the State of Illinois filed a complaint against the landfill for violating their landfill operating permit by exceeding the maximum height restriction by 20 feet or more. A court injunction ordered the landfill to cease operations and it closed in June 1988. Instead of properly covering the waste and closing the site, the owners abandoned it in July 1988. The landfill was placed on the National Priorities List (NPL) on August 30, 1990.

There was a problem at the landfill associated with inadequate soil cover, exposed refuse, and multiple leachate flows in the early 1990's that was addressed by the interim response actions in late 1991 through early 1993. Groundwater contamination has also been detected and investigated to determine the extent and remedy necessary to manage any identified risks associated with the groundwater conditions. In early 1999, a landfill gas migration problem was identified. A gas extraction system was installed within a month and the gas levels decreased when the system was activated.

PUBLIC NOTICE AND PUBLIC HEARING

The public hearing notice was published thrice (June 10, 17 and 24) in the *Boone County Journal* newspaper. The public hearing notice was published thrice (June 11, 18 and 25) in the *Belvidere Daily Republican* and in the *Rockford Register Star* newspapers. The public hearing notice was posted on the Illinois EPA's web site home page (<http://www.epa.state.il.us>) on June 18, 1999. Notice of the hearing was sent to legislators, local officials, neighbors and interested citizens on June 14, 1999.

In accordance with the Comprehensive Environmental Response, Compensation, and Liability

Act (CERCLA) of 1988 Section 117, 42 U.S.C. Section 9617 and pursuant to the Illinois EPA's *Procedures or Information and Quasi-Legislative Public Hearings* 35 Illinois Administrative Code (IAC) 164, the Illinois EPA held a public hearing on Tuesday, July 13, 1999. The public hearing began at 7 p.m. in the Boone County Community Building, 111 West 1st Street, Belvidere, Illinois. Twenty-eight persons attended the hearing with a court-reporter recording the proceedings. The Illinois EPA proposed placing a multi-component cap over the MIG/DeWane landfill according to the provisions of remedial alternative 4A. A transcript of the public hearing was prepared and is available for review at the public repository.

The Illinois EPA received written and oral public comments on the proposed landfill cap. The public comment period began on Friday, June 11, 1999 and ended on Friday, August 13, 1999. Several requests were received from individuals or groups for an extension. All requested extensions were granted and comments from those parties were due Friday, August 27, 1999.

Before determining which remedy would be most effective for the site, the Agency considered written and oral comments on any of the proposed alternatives. The final Agency decision includes this summary of questions and comments received along with Agency responses.

RESPONSIVENESS SUMMARY

The hearing record opened on Thursday, June 10, 1999, and closed on Friday, August 27, 1999. Comments postmarked by midnight August 27, 1999, were included in the hearing record. This responsiveness summary responds to questions and comments received from June 10, 1999, through August 27 (postmark), 1999, and comments from the public hearing.

Comments are a combination of direct quotes and summarized ideas (if several comments were similar) and they appear in regular type. **The Illinois EPA responses are in bold type.**

1. According to the Baseline Risk Assessment (March 1997) that evaluated the current and possible future risks associated with the site, a conclusion was made that there would be an unacceptable level of risk for "future residents" from the leachate, groundwater, and landfill gases that could flow off-site and/or under the subdivision. Since the "future residents" of 1997 are now the current residents of 1999, what actions are being taken to address and reduce the risk level to within acceptable boundaries which is necessary to protect the health of the residents?

According to the risk assessment definitions, the future residents were occupants of homes built as close as 60-100 meters (200-300 feet) from the landfill. The risk assessment also assumed chronic long term exposure from a site with no remediation. The closest home is more than 700 feet away and the site has already had some remediation with more planned, so the risk would be lower than what the 1997 risk assessment showed but the Illinois EPA agrees with the spirit of this comment that

request them to be removed at no cost to the residents. This issue will be handled by representatives of the MLTF.

In addition, the Illinois EPA has initiated a contract with the same consultant that performed the 1997 baseline risk assessment to provide an current assessment using the most recent information and sampling results so that an updated account can be made about potential health risks that may affect the residents. U.S.EPA has also provided updated comments and a re-review of the 1997 baseline risk assessment regarding whether the current conditions have significantly altered the "future residents" findings of the 1997 risk assessment. USEPA and Illinois EPA have both concluded that new sample data is needed to calculate an updated risk assessment characterizing the current conditions at the site and within the Wycliffe Estates Subdivision. Samples for this purpose were taken in February and March with results expected back within one month.

2. The area around the landfill needs to be fully and completely surveyed to determine exactly where the sand/gravel seam is present so that it can be determined which homes could be affected by the methane or any other contaminants (including chlorinated solvents) that may migrate. (This would also provide some assurance for homes that could not be affected due to an identified barrier.)

The Illinois EPA believes that the proposed remedy's provision of both an intercept trench and regular monitoring of the various gas probes and wells provides a protective barrier to gases or other contaminants (including chlorinated solvents) that could attempt to migrate into the subdivision undetected. Although a geologic survey would provide some comfort to residents, it is very costly, the drill rig itself could have trouble accessing some areas with all the homes that are now present, possibly damaging yards or structures. Operating the rig so close to homes and people presents safety concerns, and the findings may still not offer the assurance which the residents desire. We believe it is better to address any problems at the landfill source and prevent them from migrating rather than speculating where a problem would or would not occur if the contaminants were allowed to migrate.

3. There should be more monitoring wells installed, along with a 30 to 50 year monitoring plan that has frequent monitoring of all contaminants, not just methane.

The proposed remedy provides for groundwater and soil-gas samples to be taken on a long-term basis. The analysis performed on the samples would detect methane and other contaminants associated with a landfill if present. Those sample results will be available to the public for examination. If contaminant levels exceeded the regulatory standards, actions could be taken to address a problem until the levels were once again protective of human health and the environment. After an initial period of

any risk above acceptable levels must be fully addressed by the proposed plan to provide a level of protection that is both acceptable by design and by actual performance. Simply stated, the current residents of Wycliffe Estates and the surrounding area need to be protected from any adverse effect the landfill wastes may present that violates acceptable standards. The proposed remedy will provide the following actions specifically tailored to the protection of Wycliffe Estates and other area residents:

- ▶ The landfill gas interceptor trench that extends along the West side of the landfill will continue to operate as a barrier to any landfill gases trying to migrate West into the borrow pit area. The gas extraction wells behind the Bethany Drive homes will also continue to operate until the presence of landfill gas has been reduced to levels that do not pose health or flammability threats to the residents. (Note: Although the methane levels may be reduced to 0 while the extraction wells are operating, since methane is a naturally occurring gas in the ground it is expected return to very low levels. Regulatory standards protect residents from the higher unacceptable levels.) Even when the extraction wells behind the homes have completed the removal of the gases, the interceptor trench over at the landfill will continue to operate as a barrier designed to prevent any recharge from the landfill. Monitoring of the systems will be required to demonstrate their initial and continued success.
- ▶ The extraction wells have performed better than anticipated for removing the methane gas from the ground but it will require some time to remove the very last bit that is held within some of the more tightly packed clay soils. It will also take time once the system is shut off to demonstrate that even without the system running, homes remain protected. As of March 2000, six weeks worth of monitoring data had been collected and it indicates that the methane levels in both the borrow pit and the Wycliffe Estates area have been reduced below levels of concern. The monitoring data will continue to be collected into mid-April before a determination is made of whether the gas migration problem has been adequately addressed. Additional monitoring will also continue to demonstrate continued compliance and protection.
- ▶ The homes that had a venting system installed on their sump pumps have been advised to contact the MIG/DeWane landfill task force (MLTF) to settle any issues related to costs or maintenance matters. Any issues outside the regulatory jurisdiction of the Agency's at this site should contact the MLTF or consult with counsel about how to best resolve the issue.
- ▶ All the homes with the methane monitors/alarms will either be provided with the necessary maintenance and calibration service to maintain those units or will be provided with an "all clear" statement when it is issued for the area. It is our understanding that the Wycliffe home owners may either keep the detectors or

between two and five years, monitoring data is formally evaluated to determine if changes need to be made to ensure the site is in compliance. The proposed remedy also calls for site monitoring activities over a minimum of 30 years with a formal regulatory review at least every five years throughout that period. During the review process the frequency of sampling could be reduced but only if the review showed no need to continue the more frequent monitoring schedule.

4. There should be an active gas collection system and/or numerous more passive vents installed at the landfill to reduce any gas that could accumulate under the proposed full cap.

The proposed remedy mandates a system of passive vents throughout the surface of the landfill. The actual number of vents installed will need to satisfy an engineering design that shows the capability of properly venting the landfill so as to eliminate any gases from building up under the cap. If the passive vents do not relieve the gases as designed, they can be upgraded to active vents to provide the proper collection of gases. The interceptor trench and six gas extraction wells behind the Bethany Drive homes are already an active collection system and will be operated for as long as is necessary.

5. Gas probes should be installed throughout the entire subdivision.

There are currently 6 gas probes directly behind the homes along Bethany Drive and 6 additional gas probes located in the subdivision between Bethany and Jamestown Avenue. The current results indicate that additional gas probes are not necessary.

6. How do the residents know that there will not be another more serious incident?

The mandated provisions of the proposed remedy are environmentally sound enough to detect an approaching problem and binding enough to provide action to be taken in a timely manner to maintain the continual protection of the residents. The final remedy, especially for a site like MIG/DeWane landfill that has experienced a documented methane migration in the past, will be subject to even closer scrutiny than a landfill that has not revealed such a potential to influence off-site property.

7. Since the PRP's did not implement the gas removal system as proposed, but implemented a cheaper, more obtrusive system, how do we know they will implement the recommendations in the proposed plan?

During the April emergency response, the goal was to get the protective systems

operating as soon as possible. The final remedy will be outlined in a legally binding document that the PRP's sign called an Administrative Order by Consent (AOC). The PRP's must strictly adhere to the provisions of the Record of Decision (ROD) and the AOC or they could be subject to enforcement actions by the Illinois EPA and/or the U.S.EPA. During the April emergency the PRP's cooperated on a voluntarily basis and much of the strict authority available to the Agencies was not used.

8. What will the Illinois EPA and U.S.EPA do to ensure that the collection system will be maintained until it is absolutely 100% certain that there will not be another methane or toxic gas exposure to the residents?

It is not possible to provide a 100% assurance even with the system operating, but the highest level of certainty, safety, and precaution will be maintained on the citizens behalf by this Agency. We will use any provision available to us by the law to ensure complete and full compliance by the PRP's to maintain a system that is protective of human health and the environment. If for some reason the PRP's were not providing the necessary actions to ensure public safety according to the provisions of the proposed remedy and the subsequent legal documents, both the U.S.EPA and the Illinois EPA could act to maintain the protectiveness necessary.

9. Can't the blower and flare that are venting the landfill gases be relocated to somewhere that the residents won't see, hear, or smell any affects of it?

The blower and flare are currently located on the Northwest corner of the landfill, approximately 800 feet away from the closest residence. The flare is partially obstructed from view by a stand of trees and since prevailing winds are to the East, it does not pose an odor nuisance except for a very few times each year, and those few days would not pose a health exposure problem. The flare is at the location that best suits the operation of the interceptor trench system. The noise factor will be looked into to see if the flare could be maintained at its current location without causing a nuisance noise problem.

10. Given the past events where data showed a potential problem years before the emergency occurred, please report the status of the site's soil, gas, or water issues and all monitoring data to the citizens in the area on a regular basis, including any increases, decreases, spikes or trends that may or may not affect the residents of Wycliffe Estates.

The Illinois EPA will commit to providing updates of the site through the use of fact sheets and if requested, we can hold public information sessions to explain and answer questions about the data. These could be scheduled on a regular basis as the citizens desire (quarterly, bi-annually, annually, etc). If the status of something changed

quickly, an urgent message about a spike or condition could be relayed through these same channels on an even more immediate basis.

11. Can the final remedy be implemented on an expedited basis to provide for the immediate protection of the residents?

The Illinois EPA plans to sign the Record of Decision for this site in Spring 2000.

Following that, an Administrative Order by Consent (AOC) will be issued to ensure the PRP's comply by developing construction plans in 2000 with actual construction of the cap and remediation systems starting in 2001. The gas emergency systems that have been operating since April 1999 are adequately reducing the identified risks and providing for the protection of the residents. Those systems will continue to operate until the additional permanent solutions are in place or until the need for the system has been demonstrated not to be necessary.

12. Since the preferred alternative is a combination of Alternatives 4 and 5 from the FFS document and it was not actually evaluated in the FFS document as the other alternatives were, it has been proposed that the preferred alternative 4A of the proposed plan be modified in the following manner:

- i) There should be a performance basis established for each design component of Alternative 4A.
- ii) Alternative 4A should exclude any new detailed design specifications not included in Alternative 4 of the FFS.
- iii) Alternative 4A should require pre-design investigations and remedial design analysis that will produce detailed design specifications that fully satisfy the performance basis concerns.
- iv) Alternative 4A should provide flexibility with respect to the development of the detailed design specifications so that the pre-design/design process can be used to optimize the performance, implementability, and cost effectiveness of the project.

As an overall response to the entire comment, the Illinois EPA and the U.S.EPA agree that any criteria followed in the FFS to provide proper design and remedy implementation should also be performed on Alternative 4A. The proper steps will be taken to ensure that Alternative 4A is the most adequate and efficient final remedy and that will be documented in the same way as any of the selected remedies.

Now, specifically responding to the individual comments.

The Agencies agree with comment (i) and a performance based criteria may be incorporated were applicable in the design component of Alternative 4A. However, specific minimum design criteria and specifications must also be incorporated into each component.

Comment (ii) will be considered but the request to exclude any new detailed design specifications not in Alternative 4 is denied. There may be the need to include these specifications due to performance based design parameters but they will need to meet the FFS criteria for evaluation if they are to be included.

Comment (iii) will be considered but it should be noted that all aspects of this final remedial action will be considered time sensitive and although a proper evaluation of the intended remedy is necessary, the pre-design investigations and design analyses will have very appropriate expectations for expeditious progress.

The goal of the Agencies is also to optimize the performance, implementability, and cost effectiveness of the project as mentioned in comment (iv). In that spirit, the flexibility realized toward that goal will be the greatest available under the law and our ability as Agency's to work cooperatively with the PRP's.

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FUTURE ACTIVITIES

After the close of the hearing record, the Illinois EPA evaluated all comments received before considering revisions to the proposed remedy. The remedy chosen by the Agency will be described in a document called the Record of Decision (ROD). The ROD is signed by both the Illinois EPA and the U.S. EPA. It is anticipated that the office of the Illinois Attorney General will negotiate a written legal agreement called an Administrative Order by Consent (AOC) with the owners and potentially responsible parties (PRP's) of the MIG/DeWane landfill. Besides requiring the PRP's to implement the remedy as chosen in the ROD, the AOC will address many of the legal issues specifying the applicable state and federal regulations the PRP's will follow when capping the landfill.

ILLINOIS EPA PREFERRED ALTERNATIVE

Based on the evaluation of available information, **the Illinois EPA recommends Alternative 4A.**

Alternative 4A: **Estimated Cost: \$17.5 million.**

Alternative 4A was not proposed directly in the FFS. It is a modification and refinement of alternative 4. Alternative 4A involves the installation of a grading layer over the landfill side slopes, a Geosynthetic Clay Layer (GCL) cap over the entire landfill, a drainage layer over the entire landfill, and a 1½-foot protective soil layer over the GCL and drainage layer. This alternative requires the grading layer to be a minimum of 1½-feet in depth, with a final protective soil layer to be 2½-feet in depth on the crest and top of the landfill, with a minimum layer of 2-feet of protective soil at the bottom of the side slopes.

The landfill cap will conform to the Resource Conservation and Recovery Act (RCRA) requirements which include a double barrier designed to prevent infiltration of precipitation into the waste. The major differences between the use of clay or synthetic materials are availability, installation and cost. Material above the double barrier (topsoil, vegetation/rooting layer, drainage layer) and below (foundation layer) are common to all capping alternatives.

The components of storm water management, operations and maintenance, monitoring and passive gas venting are also included in the preferred alternative. The cap design would include surface water management features (e.g. berms, ditches, etc.) to direct runoff away from the landfill while minimizing erosion. The loss of soil overlying the barrier via erosion would potentially result in increased infiltration over time. Maintenance of the cap primarily focuses on repairing damage from erosion and cap settlement, and promoting an even growth of vegetation to stabilize the soil layers and prevent soil erosion. A program for long-term maintenance and monitoring would be implemented as part of this alternative. Maintenance would include regular inspections of the landfill area, repair of any damage to structures or the soil vegetation cover, and removal of sediment from ditches and other areas.

A system of passive vents to allow the release of gas vapors from the landfill waste would be constructed as a part of the landfill cap and would complement the existing active ventilation systems operating at the site.

The effectiveness of the current leachate system on the Northeastern third of the landfill has been successful and a leachate collection system for the other two thirds of the landfill will be installed. Monitor wells will be placed down-gradient of the landfill to monitor any leachate that is not being captured as well as groundwater conditions.

The FFS document includes a detailed analysis of all the remedial alternatives. The evaluation process was developed on the basis of the U.S.EPA Interim Final document "Guidance for Conducting Remedial Investigations and Feasibility Studies" under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1988. That guidance document was developed based on the statutory requirements of CERCLA, program initiatives promulgated under the National Contingency Plan (NCP), and experience gained in the Superfund program. This proposed remedial alternative is consistent with the National Oil and Hazardous Substances Pollution Contingency Plan and the Comprehensive Environmental Response, Compensation, and Liability Act.

PUBLIC REPOSITORY

All documents are currently available for viewing at:

Ida Public Library
320 North State Street
Belvidere, IL 61008

Please ask for the "MIG/DeWane" repository. The library is handicap accessible and has photo copiers available for cost.

DISTRIBUTION OF RESPONSIVENESS SUMMARY

Copies of this responsiveness summary will be mailed to all who registered at the July 13, 1999 hearing and to all who submitted written comments. Additional copies of this responsiveness summary are available from Mark Britton of the Illinois EPA-Office of Community Relations. (See below for address)

ILLINOIS EPA STAFF WHO CAN ANSWER YOUR QUESTIONS

Please contact the following individuals if you have any questions or concerns about this site.

Rick Lanham, Project Manager	Mark Britton, Community Relations Coordinator
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217/782-9881	217/524-7342

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HEARING RECORD AVAILABILITY

The following items are available from the Illinois EPA hearing officer for examination and review:

1. Public hearing notice.
2. Transcript of the July 13, 1999, public hearing.
3. Public hearing attendance record and authors of exhibits.
4. Hearing record exhibit list of letters, documents and notices.
5. Letters, documents and notices contained in the hearing record.

Illinois Environmental Protection Agency - Hearing officer
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